

# ***Lava Beds National Monument***

## ***Cave Life Education Kit***

### **Introduction**

This teacher education kit contains six activity units. The first five units address topics related to cave environments, geology, critters that live in caves and human activity related to caves. The final unit discusses climate change and environmental factors that affect caves and cave life, at the end of this section there is a board game that provides an overview to entire kit. The units are specifically designed to teach about caves and cave life that can be found in the northern California/southern Oregon region with special emphasis on Lava Beds National Monument. All activities are designed for use in the classroom, and the school yard.

Each unit contains background information for use by the teacher, and at least one activity to be incorporated into the classroom. Most materials necessary to present these activities have been included in this package. These activities are written for upper elementary students, but many can be expanded or modified for other grade levels. Some of the activities already include suggestions for different grade levels.

Each activity will also include a set of symbols representing, things that you the teacher will ask or read, what the student is required to complete, what the student will read or present and writing assignments for students.



- Teacher will read or ask the class



- Checklist of student requirements for activity



- Students will read and/or present to the classroom



- Writing assignment for students

The primary goal of this education kit is to enable the teacher to present information in the classroom before conducting a field trip to the monument. We hope that by using this guide the visit to Lava Beds will be a comprehensive educational experience.

### **Overview of Units**

#### **Unit 1 – What is a Cave? / Geology of Caves**

This unit is designed to get students thinking about what caves are and the various ways they are formed. In this unit students will brainstorm what caves are, watch a video on National Park Service caves, make a cave advertisement, and start making cave crystals.

##### **Activity A: What is a Cave?**

Students will start out by brainstorming what a cave is, prior to watching a video about caves. While watching the video students will complete a fill in the blank worksheet

##### **Contents:**

- DVD & VHS Copies of : Caves of the National Parks, The Wonder Beneath

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- Caves of the National Park Service; The Wonder Beneath: Student Log Sheet (**Make Copies**)
- Caves of the National Park Service; The Wonder Beneath: Teacher Answer Sheet

### **Activity B: What's The Difference?**

Students will break into groups where they will compare the difference between different types of caves by making an advertisement or poster describing what makes their type of cave unique. Included in the kit are various books that the students can use to learn more about their type of cave.

#### **Contents:**

- Caves by Neil Morris
- One Small Square: Cave by Donald M. Silver
- Rock and Minerals by Neil Morris

#### **You will need to provide:**

- Paper
- Paint, or Crayons, or Color Pencils, etc.

### **Activity C: Cave Formations**

Students will learn cave formations from both lava caves and solution caves. They will also be making cave crystals using Epson salt, water and a sponge. These cave crystals will be used through out the rest of the units.

#### **Contents:**

- Cave Formation Flash Cards
- Sponges
- An Illustrated Glossary of Lava Tube Features by Western Speleological Survey
- Cave Formation: Student Log Sheet (**Make Copies**)

#### **You will need to provide:**

- Trays that are at least 1 inch deep.
- Sponges
- Epson salt
- Warm water

## **Unit 2 – Cave Ecosystems/Zones**

The unit covers the different light zones within a cave and how the habitat changes between zones. In this unit students will color in the different zones found throughout a cave and at its entrance. They will also brainstorm and create images of animals they think might living within a cave and explain which zone they live in.

### **Activity A: Map That Zone**

After learning the main parts and classifications of each zone, students will use the dry erase markers to shade in the caves zones are the large laminated map. Students will also gather or create images of animals they think might life in a cave, and explain why they think that and in what zone of the cave the animal lives in.

#### **Contents:**

- Large Laminated Side View Cave Map
- Dry Erase Markers
- Photos, drawings, images that students brought in or created.

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### **Unit 3 – What Lives Here & How Has It Adapted?**

This unit addresses the different animal species that live in caves and how those animals have adapted to the cave environment. This unit contains 3 different activities that help students to learn why certain animals live in certain sections of a cave.

#### **Activity A: Troglomania**

In this activity students will expand the definitions for troglobite, troglophile, and troglaxene. Students will also receive comparison cards that assist students in learning the different adaptations between surface and cave critters.

##### **Contents:**

- Copies of Cave Sleuths by Laurie Lindop, Chapter Six (pages 49-53)
- Animal Comparison Cards
  - Troglobite Comparison Cards (Blue)
  - Troglophile Comparison Cards (Yellow)
  - Troglaxene Comparison Cards (Pink)
- Troglomania: Student Log Sheet, Comparison Cards (**Make Copies**)
- Troglomania: Student Log Sheet: Cave Sleuths (**Make Copies**)

#### **Activity B: Bats**

Lets get batty!! Students will discover adaptations that allow bats to occupy caves, while they take skeletal look at bats.

##### **Contents:**

- Discover Bats Video & Activity Book by Bat Conservation International
- Endangered Bats by Bobbie Kalman
- What is a Bat book & CD by Bobbie Kalman
- Sound Wars article by Brock Fenton
- Bat Skelton
- Create a Bat Kit
- Bat Poster

#### **Activity C: Classroom Cave**

Turn the lights off, close most of the curtains, hang some of the student made bats around, and see how well your students know their troglobites, troglophiles, and troglaxens. Using the cave critter cards and the description of the animal, students will try to pick their habitat within the cave.

##### **Contents:**

- Animal Comparison Cards
- Student made bats from Unit 3 - Activity B
- Cave Safely, Cave Softly Rules (Extension 1 & 2)
- Cave Safely, Cave Softly Flash Cards (Extension 2)

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### **Unit 4 – Humans & Caves**

In this unit students will brainstorm and learn about the various human uses of caves. They will compare and understand the difference between past and present usages of caves.

#### **Activity A: Pictography (past use)**

In this activity students will create their own rock art, after learning the significance of rock art found within Lava Beds

##### **Contents:**

- Sand paper
- Prehistoric Caves by Colleen O'Connor Olson

##### **You will need to provide:**

- Finger Paint
- Construction Paper (optional)
- Cotton Swabs (optional)

#### **Activity B: Your Cave Experience (present use)**

For this activity students will write a journal entry about a time when they explored a cave. If they have never been caving they can write about what it might be like, or anything else related to present usage of caves.

#### **Activity C: How Do We Damage Caves?**

In this activity students will try to measure their cave crystals. In doing this, crystals will break off allowing for the discussion section of this activity to take place.

##### **Contents:**

- Cave Crystals from Unit 1 Activity C
- Magnifying glasses
- MM ruler
- US Map of Karsts and Federal Karsts Areas
- Cave Formation Data Collection: Student Log Sheet (**Make Copies**)

### **Unit 5 – Cave Research**

This unit focuses on various cave research projects that have taken place and also projects currently taking place at Lava Beds National Monument. Once students have learned about these projects they then will write their own research proposal.

#### **Activity A: Current Cave Life Research**

In this activity students will learn about various cave research projects and how these projects could have importance far beyond the cave they are taking place in.

##### **Contents:**

- DVD & VHS copies of Mysterious Life of Caves video
- Copies of Cave Sleuths, Chapter Three (pages 22-29)
- Copies of Cave Sleuths, Chapter Five (pages 38-48)
- Cave Sleuths Chapter 3: Student Log Sheet (**Make Copies**)
- Cave Sleuths Chapter 5: Student Log Sheet (**Make Copies**)

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### **Activity B: Cave Life Research Proposal**

In this activity students will write their own research proposals based on their grade level, after they learn about a current bat research project happening at Lava Beds.

#### **Contents:**

- Bat Research at Lava Beds Article

## **Unit 6 – Environmental Change**

This final unit is designed to get students thinking about what would happen to a cave environment and the animals that use that environment if an environmental change occurred. This unit also provides a great overview of the entire kit

### **Activity A: Environmental Changes & Caves.**

In this activity students will think back over what they have learned about cave environments and the animals that live in them and try to figure how what would happen if one element of that environment changed.

### **Activity B: Cave Life Board Game**

Lets Play!! In this activity students will play the Lava Beds Cave Life game as they review all that they have learned about caves and cave life.

#### **Contents:**

- Game Board
- Game Question Cards (3 sets of cards)
- Game Answer Sheets
- Polished rocks
- Dice